

the only evidence being used to reject claim 20, and particularly to disclose the nanocavities in claim 20. Now, the final office action in the “response to arguments” incorporates Visconti: “the Visconti prior art discloses the well known in the art the nanocavities.”

This represents a changed basis for the rejection that Applicants have not had an opportunity to address. Previously, regarding claim 20, the examiner pointed to item 38 in Fig. 9 of Yoshimura as corresponding to the claimed nanocavity. In response, Applicants pointed out that there is no item 38 in Fig. 9 in response A. Now, the final office action points to Visconti. (The examiner has also maintained the rejection based on Yoshimura; however, the examiner has not addressed the defect in the original rejection.) The basis for rejection has changed, and the new rejection was not necessitated by amendment, rendering the finality of the rejection is not inappropriate. Reconsideration and withdrawal of the finality of the rejection is respectfully requested.

The other additional arguments and rejections in the final office action are addressed below.

Claims 1-4 stand rejected under 35 U.S.C. 102(e) as being anticipated by Yoshimura. Claims 5-21 stand rejected under § 103 over Yoshimura and Kumar (and Visconti as applied to claims 20 and 21). The rejections have been maintained and made final. The rejections are respectfully traversed.

As an initial matter, the examiner has changed the basis for the rejection from 102(b) to 102(e). This is also a new ground of rejection that should prevent finality from being applied.

Nonetheless, the rejections have been maintained and made final. The examiner’s rejection and additional comments “responsive to arguments” are addressed as follows.

Claim 1 recites, in part: holographically patterning the photoresist layer to form a patterned mask. Applicants respectfully submit that Yoshimura (alone or in combination with Kumar) fails to teach or suggest at least that limitation. For the reasons set forth more fully below, Applicants request reconsideration of the rejection of claim 1.

Basically, as the Applicants understand the rejection, the final office action on page 6 seems to take the position that because “holographic patterning” is mentioned in column 38 and “photoresist” is mentioned elsewhere in the reference, then a §102 rejection is appropriate despite the fact that the reference never discusses “patterning” photoresist by holographic patterning. By contrast, the reference only discusses the use of holographic means with respect to the “remov[al] by photo exposure” patterning of material from waveguide 124b when it is “is formed from a photosensitive core material”. C38, L45-60.

The “response to arguments” tries to cure this deficiency in Yoshimura by citing to “patterning” in column 11. However, this portion of column 11 is the brief description of FIG. 332, which shows a photoresist layer 1730. Nowhere, however, does the reference state that the photoresist 1730 is holographically patterned.

In the description of column 79, lines 40-41, the use of “grating or hologram” is discussed with respect to the **formation of** waveguide 1712 (consistent with column 38) is described as possible being patterned by “grating or hologram”. There is no mention or suggestion of holographic patterning of the photoresist layer, however, and clearly none is contemplated in the reference.

When the reference does describe patterning of photo resist, it describes the utterly conventional process of “anisotropic plasma etching through an etch mask”. C51, L37-49.

Applicants also carefully considered the citation to column 26, lines 1-15 in the examiner’s response to argument, but these lines merely mention that conventional wet or dry etching that can be used for material removal after a patterned is established with a photoresist layer. This portion says nothing about how the photoresist layer is patterned.

The “response to arguments” section continues with the mistaken assumption that it is enough that the reference discloses holographic patterning and also discloses photoresist. This is mistaken, because a proper 102 rejection requires that the reference disclose holograph patterning OF photoresist. Applicants have carefully

reviewed the reference and cannot find any disclosure of holographic “patterning” OF photoresist and the reference does not describe or contemplate the “holographic patterning” of photoresist. Applicant only finds standard patterning and developing of photoresist, e.g., C51, L1-5, and no mention of using the holographic patterning for patterning of photoresist.

The portions of the reference that disclose holographic patterning only concern holographic patterning of the core that “is formed from a photosensitive core material”. C38, L45-60. This is a direct process because the core is photosensitive material. The reference clearly assumes that photoresist can’t be used to form the fine patterns required by the core because the reference merely uses the photoresist for metallization patterns. In FIG. 332, which is pointed to by the examiner, the core has already been formed and what is illustrated is a processes using photoresist to pattern the metal and polymer layers 1732, 1716, 1718. Nowhere are the fine patterns required for optical elements described in the reference as being formed with photoresist, because nowhere does the reference discuss the ability to form the fine resolution pattern that is required with photoresist. In contrast, the invention as defined in claim 1 (with the holographic patterning of photoresist) can produce sub-wavelength surface relief patterns (Page 4, Lines 18-20).

For at least the foregoing reasons, applicants submit that the claim 1 patentably defines over Yoshimura. Inasmuch as claims 2-4 depend from and incorporate the limitations of claim1, Applicants submit that they also patentably define over Yoshimura for at least the same reasons that claim 1 defines over Yoshimura and for their separate additional features.

There are other reasons by which the dependent claims may also define over Yoshimura. For example, with respect to claim 4, the examiner, in the response to arguments section, the final office action points to column 62, lines 21-22. Applicants respectfully submit that this section discusses the active layers 320 and IC chip layers, mentions forming of vertical waveguides, and the bonding of sheets of photorefractive materials. Where is a defect mentioned here? It is not. Where is photoresist material

mentioned here? It is not. Where is a mask mentioned here? It is not. The statements of the examiner are nowhere supported in the sections cited. Applicants have carefully reviewed the cited portions and find no mention of writing a defect into a patterned mask as is claimed.

Claims 5-21 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshimura et al. in view of Kumar et al. (U.S. 5,223,356). Applicants respectfully disagree. With respect to claims 2-19, Applicants respectfully submit that they patentably define over Yoshimura et al. in view of Kumar et al. for at least the reasons set forth above with respect to claim 1. Regarding claim 20, Applicants essentially reiterate arguments made in the previous action. In particular, claim 20 recites, in part: “nanocavites etched into the multi-layer structure....”. The examiner cited “Figure 9, #38” as meeting this limitation. There is no such element in Figure 9. For that reason alone, the rejection is improper. There are no nanocavities discussed with respect to Figure 9. Moreover, the specification does not discuss nanocavities. For that reason alone, Applicants respectfully request reconsideration.

As discussed above with respect to the finality of the rejection, the examiner cited to Visconti as disclosing well-known nanocavites, but that is either a new ground of rejection or not relevant to the present rejection. If it is a new ground of rejection then the finality is improper. Moreover, the examiner has failed to provide a reason why or how it should be combined with Yoshimura.

Regarding claim 21, Yoshimura, as discussed above with respect to claim 1 does not disclose any patterning of photoresist via holography. Instead, Yoshimura only uses photoresist for patterning of metal layers. Yoshimura assumes that holography can only be used when the core is formed of “photosensitive core material” and in that context the holography is discussed with respect to the removal of material. C38, L45-60.

Moreover, the examiner also cites to Kumar as well as “well-known in the art”, incorporating Visconti. However, the rejection is improper for the reasons stated above and also because the examiner provides no reasons why or how the various references can be combined as is required in a § 103 rejection.

The examiner now incorporates Visconti. This can't be supported because Yoshimura does not disclose any holographic patterning of photoresist. Visconti, on the other hand, notes the difficulties with pattern transfer processes, see page 1. As Yoshimura does not disclose any patterning of photoresist via holography (or any need to do so because the photoresist is not used for optical scale patterns) and Visconti is concerned with the difficulty of transferring optical scale patterns, there is nothing about Visconti that illustrates something about photoresist patterning in Yoshimura is "well-known". With respect to Kumar, Kumar would, at most, suggest a modification of Yoshimura's patterning of core material because Yoshimura does not disclose any patterning of photoresist via holographic patterning.

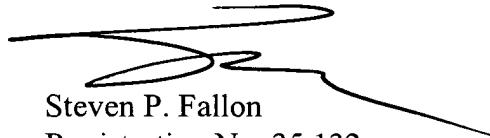
For all the above reasons, applicants respectively request reconsideration and allowance of the application. Should the examiner believe that a telephone conference would aid in the prosecution of the application, the examiner is invited to contact the undersigned attorney at the below-listed number.

Respectfully submitted,

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